UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/500,119	06/17/2005	Hidehiro Nakamura	1204.43988X00	7910

20457 7590 04/30/2008

ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-3873

EXAMINER	
PATEL, ISHWARBHAI B	
ART UNIT	PAPER NUMBER
2841	

MAIL DATE	DELIVERY MODE
04/30/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/500,119	NAKAMURA ET AL.	
	Examiner	Art Unit	
	Ishwar (I. B.) Patel	2841	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *14 January 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6 and 51-59* is/are pending in the application.

4a) Of the above claim(s) *51* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 52-59* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 June 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to amendment filed on January 14, 2008. As claim 51 with the limitation "said insulating resin composition layer includes at least two sub layers" is not reading on the elected specie of figure 1d, it has been withdrawn from further consideration.

Claim Objections

2. Claim 54 is objected to because of the following informalities: Regarding claim 54, the language "wherein the connection conductor is etching a metallic layer of copper" is unclear. It is considered to be "wherein the connection conductor is **formed by** etching a metallic layer of copper." The prior art applied accordingly.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-6 and 55-58 are rejected under 35 U.S.C. 102(b) as being anticipated by Jester (US Patent No. 5,719,354).

Regarding claim 1, Jester in figure 1B, discloses a connection board comprising an insulating resin composition layer (10) formed of at least one sub-layer (see figure) and a connection conductor (12, labeled in figure 1A) which is formed so as to pass through the insulating resin composition layer in its thickness direction at least at a position where a conductor circuit (16, labeled in figure 1A) is connected (see figure), wherein connection conductor is all made of a metal (column 3, line 20-25).

Regarding claim 2, Jester further discloses a conductor circuit (16, labeled in figure 1A), which is electrically connected to the connection conductor for at least one surface of the connection board.

Regarding claim 3, Jester further discloses the conductor circuit is a metallic layer (column 3, line 26-30).

Regarding claim 4, Jester further discloses an exposed portion of the connection conductor is covered with metal (see figure).

Regarding claim 5, Jester further discloses at least one sub-layer of the insulating resin composition layer, placed at least one of front and rear outermost layers

of the insulating resin composition layer, is mainly made of thermoplastic resin (column 3, line 45-60).

Regarding claim 6, Jester further discloses at least one sub-layer of the insulating resin composition layer, which is at least one of a front surface layer and a rear surface layer of the insulating resin composition layer, contains a liquid crystal polymer (column 3, line 45-60).

Regarding claim 55, Jester further discloses the connection conductor is covered (see figure) with one or more selected from the group consisting of copper, indium, zinc, lead, gold, platinum, nickel, palladium, tin, and alloys thereof (covered by thin layer 16 made of conductive material such as copper, column 3, line 25-30).

Regarding claim 56, Jester further discloses the connection conductor is covered by copper as applied to claim 55 above. How the cover is formed, either by performing electroless copper plating etc., is a process limitation in a product claim. Such a process limitation defines the claimed invention over the prior art to the degree that it defines the product itself. A process limitation cannot serve to patentably distinguish the product over the prior art, in the case that the product is same as, or obvious over the prior art. See Product-by-Process in MPEP § 2113 and 2173.05(p) and *In re Thorpe*, 777 F.2d 695, 227 USPQ 964, 966 (Fed. Cir. 1985). The modified board of Jester discloses the structure. Therefore, Jester meets the limitation.

Regarding claim 57, Jester further discloses said connection conductor is a solid all-metal member (column 3, line 23-26).

Regarding claim 58, Jester further discloses a surface of the connection conductor is exposed through at least one surface of the insulating resin composition layer in the thickness direction of the insulating resin composition layer, and the exposed surface of the connection conductor is covered with a metal layer (16).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 52 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jester applied to claim 50 above in view of Hoke (US Patent No. 5,852,486).

Regarding claim 52, Jester discloses all the features of the claimed invention as applied to claim 52 above, including various kind of Liquid Crystal Polymer material made by various manufacturers such as VECTR ® by Hoechst and XYDAR ® by Amoco Co. (column 3, line 45 to column 4, line 20), but does not explicitly disclose the liquid crystal polymer has 180°C or higher of phase transition temperature from smectic

phase to nematic phase, as recited in claim 52 or the liquid crystal polymer has 280°C or higher of phase transition temperature from smectic phase to nematic phase as recited in claim 53. However, Jester further recites that the material selected to have the desired bonding property (column 4, line 15-20).

Hoke discloses use of liquid crystal polymer and recites that material will be selected to have desired property such as fluidity and temperature range (column 1, line 10-20).

Therefore, it would have been obvious to a person of ordinary skill in the art to provide the board of Jester with the liquid crystal polymer with the property as recited in claims 52 and 53, as taught by Hoke, in order to have desired bonding property, fluidity and temperature range.

7. Claim 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jester as applied to claim 1 above, and further in view of Reimann (US Patent No. 4,663,497).

Regarding claim 54, Jester discloses all the features of the claimed invention as applied to claim 1 above including the connection conductor made by filling the holes with solder or by electroplating (column 3, line 24-26) but does not explicitly disclose the copper material. However, use of copper for via connection is old and known the art for better electrical connection between two layers. Reimann discloses via filled with copper (column 4, line 6-10).

Therefore, it would have been obvious to a person of ordinary skill in the art to provide the board of Jester with connection conductor made of copper, as taught by Reimann, in order to have better electrical connection between two surfaces.

Further, it has been held to be within the general skill of a worker to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960).

Regarding the limitation, the connection conductor is formed by etching a metallic layer of copper. It is a process limitation in a product claim. Such a process limitation defines the claimed invention over the prior art to the degree that it defines the product itself. A process limitation cannot serve to patentably distinguish the product over the prior art, in the case that the product is same as, or obvious over the prior art. See Product-by-Process in MPEP § 2113 and 2173.05(p) and *In re Thorpe*, 777 F.2d 695, 227 USPQ 964, 966 (Fed. Cir. 1985). The modified board of Jester discloses the structure. Therefor, Jester meets the limitation.

Regarding claim 59, Jester discloses all the features of the claimed invention as applied to claim 1 above including the surfaces of the connection conductor are exposed through both surfaces of the insulating resin composition layer in the thickness direction, but does not explicitly disclose both the exposed surfaces of the connection conductor are covered with metal layers. Jester discloses only one surface covered by metal layer. Reimann in figure 8 discloses a circuit board with connection conductor (38)

covered from both surfaces by metal layer (36, 38) to avoid damage to the connection conductor in subsequent processing.

Therefore, it would have been obvious to a person of ordinary skill in the art to provide the board of Jester with connection conductor covered from both sides, as taught by Reimann, in order to avoid damage to connection conductor in subsequent processing.

Response to Arguments

8. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bross (US Patent No. 5,259,110) in figure 2 discloses a circuit board with liquid crystal polymer layer (10) having a connector conductor (12) made of metal piece of copper with gold cover on the both of the end surfaces (column 3, line 1-10).

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (571) 272 1933. The examiner can normally be reached on M-F (8:30 - 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on (571) 272 1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ibp
April 24, 2008

/Ishwar (I. B.) Patel/
Primary Examiner, Art Unit 2841